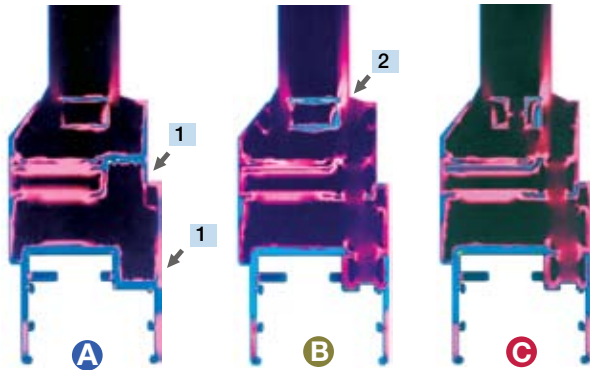


WARM-LIGHT® Comparison of 3 spacer types



Figure 1. Thermodynamic imaging

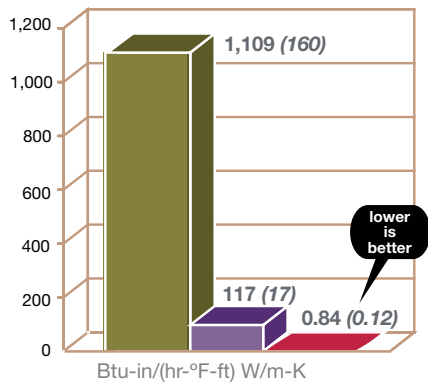


- A** Insulating glass unit with low-E, aluminum spacer and aluminum frame. The heat flow is through the frame as shown in blue at mid-point 1.
- B** The same low-E unit with an aluminum spacer and thermal barrier frame. The heat flow is now through the spacer as depicted by the blue through the spacer 2.
- C** Total performance package: A low-E unit with Warm-Light® spacer and a thermal barrier frame. There is no direct heat-flow path.

based on temperature outside: -17.8°C (0°F)

ambient temperature inside: 21.1°C (70°F)

Figure 2. Thermal conductivity



Reference:

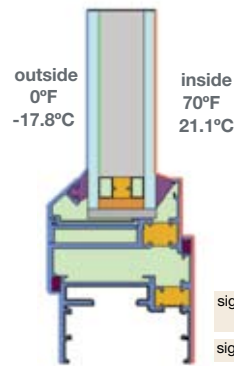
*NFRC 101: Procedure for Determining Thermophysical Properties of Materials For Use in NFRC-Approved Software Programs

*National Fenestration Rating Council

Spacer comparisons

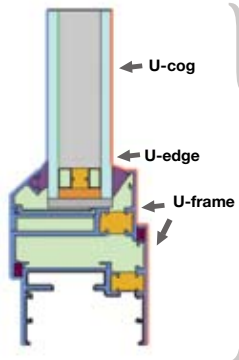
- conventional aluminum
- stainless steel
- Warm-Light® by Azon

Figure 3. Sightline CRF



CRF or condensation resistance factor is a value that measures the efficiency of a window. The higher the calculated number, the less likely condensation will form.

Figure 4. U-factors



Total U-factor is measured by the overall performance of the glass and the frame:

U-cog = U-factor center of glass

U-edge = weighted average of U-cog and sightline properties (spacer)

U-frame = heat transfer below sightline (spacer)

U-factor = weighted average of U-cog + U-edge + U-frame

| | double silver low-E aluminum spacer | double silver low-E stainless steel spacer | double silver low-E Warm-Light® spacer |
|----------|-------------------------------------|--------------------------------------------|----------------------------------------|
| U-cog | 0.29 (1.69) | 0.29 (1.69) | 0.29 (1.69) |
| U-edge | 0.47 (2.71) | 0.45 (2.60) | 0.42 (2.42) |
| U-frame | 0.62 (3.58) | 0.60 (3.47) | 0.58 (3.35) |
| U-factor | 0.45 (2.60) | 0.44 (2.54) | 0.43 (2.48) |

Btu-in/(hr-°F-ft²) W/m²-K

All calculations and thermal graphics were created with *Therm 5* and *Window 5.1*. *Therm 5* and *Window 5.1* are trademarks of Lawrence Berkeley National Laboratory.

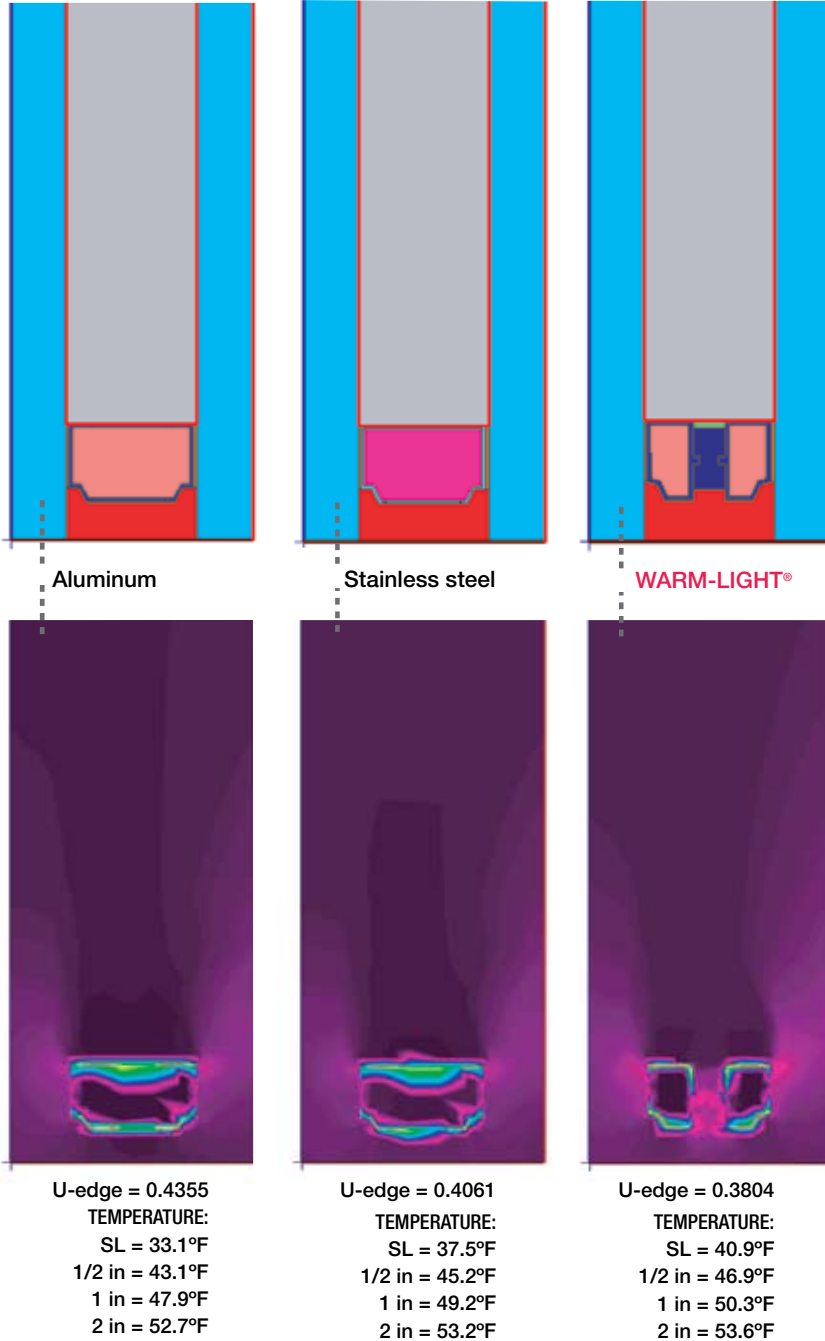
Spacer Performance Data

WARM-LIGHT®

Figure 5. Insulating glass make-ups with color flux magnitude (second row).

Insulating glass, all units:
1/4 in Solar Ban 60, 1/2 in spacer, 1/4 in clear

U-cog = 0.294
(U-factor center of glass)



Fenestration system components, including air spacer material, affect outdoor /indoor sound transmission in the exterior wall. Please refer to *Technical bulletin WL004 for Acoustic Performance* information.

Contact the **AZO/Tec**® technical department for CAD drawings and specifications azotec@azonusa.com.